Surgical Technique

smith&nephew

TRIGEN® META-NAIL®

Semi-extended Instrument Set

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Nota Bene

The technique description herein is made available to the healthcare professional to illustrate the authors' suggested treatment for the uncomplicated procedure. In the final analysis, the preferred treatment is that which addresses the needs of the patient.

The technique is based on the tibial nailing approach outlined in the article below:
Tornetta P, 3rd, Collins E. Semiextended position of intramedullary nailing of the proximal tibia. Clin Orthop Relat Res. 1996: Number 328, pp 185-189.

Introduction

The following technique is for informational and educational purposes only. It is not intended to serve as medical advice. It is the responsibility of treating physicians to determine and utilize the appropriate products and techniques, according to their own clinical judgement, for each of their patients. For more information on the TRIGEN® META-NAIL® Tibial Nail System, including its indications for use, contraindications, and product safety information, please refer to the product's label, the Instructions for Use (REF 81068703) packaged with the product, and, if using the TRIGEN SURESHOT® Distal Targeting System, the TRIGEN SURESHOT Distal Targeting System User Manual (REF 7118-1540).

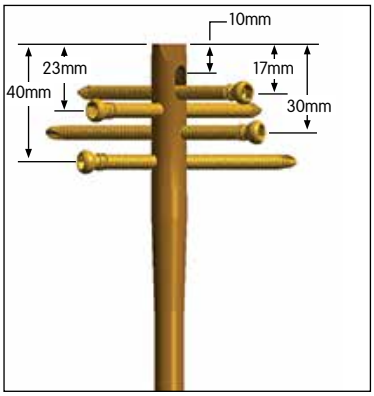
The TRIGEN META-NAIL Tibial Nail System is designed specifically to repair fractures of the proximal and distal thirds of the tibia, including the shaft, stable and unstable fractures, nonunions, malunions, and for the prophylactic nailing of impending pathological fractures.

The META-NAIL System can be used with or without the SURESHOT Distal Targeting System. If using the SURESHOT Distal Targeting System, be sure to read and understand the TRIGEN SURESHOT Distal Targeting System User Manual (REF 7118-1540). Only trained operators are allowed to use the TRIGEN SURESHOT Distal Targeting System.

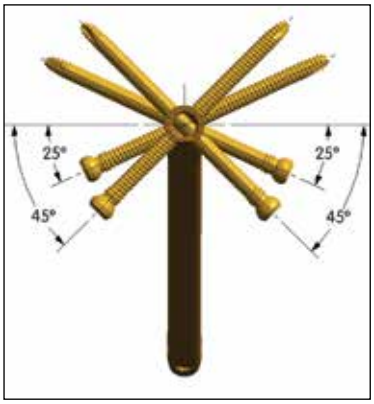
TRIGEN® META-NAIL® Tibial Nail Specifications

ML view

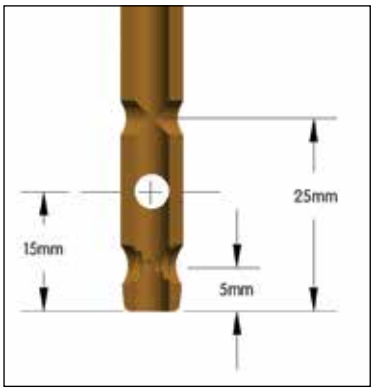
Figure 1



Distal end of nail
(all knee and distal tibial)



Top view of nail



Non-driving end of nail
(AP view)

Specifications	TRIGEN META-NAIL Tibia (8.5mm)	TRIGEN META-NAIL Tibia
Material	Ti6Al4V	Ti6Al4V
Diameter	8.5mm	10, 11.5 & 13mm
Lengths	16-50cm*	16-50cm*
Nail Color	Grey	Gold
Cross Section	Round	Round
Proximal Diameter (driving end)	12mm	12mm (10, 11.5 diameter) 13mm (13 diameter)
Distal Diameter (non-driving end)	8.5mm	10, 11.5 and 13mm
Smallest Through Diameter	4.8mm	5.0mm
Wall Thickness	1.9mm	2.3mm (10) 3.0mm (11.5) 2.3mm (13)
Guide Bolt Thread	5/16-24 UNF	5/16-24 UNF
Screw Diameter	4.5mm	5.0mm
Screw Color	Grey	Gold
Major Diameter	4.5mm	5.0mm
Minor Diameter (core)	4.0mm	4.3mm
Screw Lengths	25-65mm	25-110mm
Hex Size	4.7mm	4.7mm
Alternative Hexdrivers	RT Femoral & Recon 7.0mm Cannulated Screw PERI-LOC® Locking Screw	RT Femoral & Recon 7.0mm Cannulated Screw PERI-LOC 4.7mm Hexdriver PROFIX® 4.7mm Hexdriver
Alternative Modes	No	No
Proximal Locking (Driving End)		
Static Lock Locations/Orientations	17mm/45° Screw Locked w/META-NAIL Cap 23mm/45° Threaded w/bushing 30mm/25° Threaded 40mm/25° Threaded	
Static Locking Hole Dimensions	Threaded 4.3mm minor diameter Threaded 4.7mm major diameter	Threaded 4.5mm minor diameter Threaded 5.3mm major diameter
Compression/Dynamic Slot Location	10mm	10mm
Compression/Dynamic Slot Diameter/Length	4.7mm/7mm	5.3mm/7mm
Degree of Proximal Bend (Herzog)	10°	10°
Proximal Bend Location	27mm	27mm
Distal Locking (Non-Driving End)		
Static Lock Locations/ Orientations	25mm/ML 15mm/AP 5mm/ML (Threaded)	25mm/ML 15mm/AP 5mm/ML (Threaded)
Static Locking Hole Dimensions	4.7mm**	5.3mm**
Degree of Distal Bend	2°	2°
Distal Bend Location	60mm	60mm

Note: These views are not to scale and should be used as a pictorial representation only.

*Set does not include all sizes.

**Most distal hole threaded.

Surgical Technique

Patient positioning

Position the patient supine on a radiolucent table with the unaffected limb extended away from the affected limb.

For the semi-extended technique, the operative limb should be in 10–20° of flexion.

Caution: *If using the TRIGEN® SURESHOT® Distal Targeting System, verify that there are no metal objects in the immediate targeting area. Metal interference will cause the SURESHOT System to be inaccurate.*

Figure 2

Prepare the Entry Tube

1. Inspect the Entry Tube to ensure that it is not damaged, bent or chipped. Any flaws in the tube can lead to damage of the surrounding tendons and tissues.
2. Assemble the Entry Tube (7165-4526) to the Entry Portal Handle (7167-4092) by pulling back the black trigger of the Entry Portal Handle and inserting the Entry Tube into the handle ring.
3. Turn the tube until it clicks into a locked position.
4. Place the Guide Pin Sleeve (7165-4527) through the tube until it locks into both the end of the sleeve and Entry Portal Handle ring.

   Optional: Suction can be applied to the Entry Portal Handle.

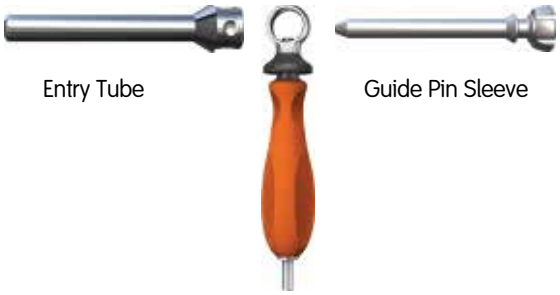


Figure 3

Incision and entry point: Lateral subluxation of the patella

1. Make a midline skin incision approximately 1.5 inches in length from the upper pole of the patella to the middle of the patella (Figure 4). Make a second deep incision medial to the patella, cutting the superior two-thirds of the medial retinaculum, but leaving the cuff intact.
2. Extend the incision 1–2cm into the quadriceps tendon (Figure 5). This incision is through the medial one-third of the quadriceps tendon as outlined in the image.
3. Sublux the patella laterally and pass the fully assembled entry tube through the skin incision until it is sitting on the tibial plateau (Figure 6).

Figure 4

Figure 5

Figure 6

Entry portal acquisition

1. Use the femoral condyles as guides for proper tube placement, making sure that the Guide Pin Sleeve sits at the appropriate entry point (Figure 7).
2. Locate the entry point just medial to the lateral tibial eminence in the AP view, and in line with the anterior cortex and intramedullary canal in the lateral view (Figure 8).
3. Attach the 3.2mm Brad Point Guide Pin (7167-4130 or 7163-1436) to the drill via the Mini Connector (7163-1186) and insert the guide pin into the Guide Pin Sleeve (Figure 9).

   Note: If the guide pin insertion is suboptimal, insert the Semi-extended Honeycomb (7165-4533) and rotate the Honeycomb within the Entry Tube to the desired location. Insert another 3.2mm Brad Point Guide Pin. Avoid over-insertion of the guide pin as this can establish a false trajectory and subsequently cause fracture malalignment.

Figure 7

AP Lateral

Figure 8

Figure 9

Entry portal

1. After guide pin placement, remove the Guide Pin Sleeve and carefully slide the Entry Tube down and onto the tibial plateau (Figure 10).
2. Attach the 12.5mm Entry Reamer (7163-1116) to a power drill. Advance the reamer over the guide pin and through the Entry Tube into the tibia to a depth of 4–6cm. Maintain alignment to avoid penetration of the posterior cortex.
3. Check position of the entry reamer via radiographic imaging and then remove the Entry Reamer and Guide Pin.

Figure 10

Alternative technique: Entry portal

1. With the Entry Tube (Figure 11) and Entry Portal Handle (Figure 12) still in the joint space, attach the T-handle (7167-4076 or 7167-4576) (Figure 13) to the Cannulated Awl (Figure 14).

   Note: Introduce the 3.2mm T-handle Trocar (7167-4074) (Figure 15) into the back of the assembly prior to insertion in order to prevent awl slippage and the accumulation of cortical bone within the cannulation.

2. Insert the awl into the proximal tibia to a depth of 4–6cm.

Entry Tube

Cat. No. 7165-4526

Figure 11

Entry Portal Handle

Cat. No. 7167-4092

Figure 12

T-handle

Cat. No. 7167-4076 or 7167-4576

Figure 13

Cannulated Awl

Cat. No. 7167-4000

Figure 14

3.2mm T-handle Trocar

Cat. No. 7167-4074

Figure 15

Reduce the Fracture

1. Open the Gripper (7167-4080).
2. Insert the smooth back end of the 3.0mm Ball Tip Guide (7163-1626) into the front of the Gripper and gently close the trigger grip (Figure 16).
3. Connect the Reducer and Reducer Connector (7167-4077) so that the words “Slot Orientation” are in line with the opening at the Reducer’s tip (Figure 17).

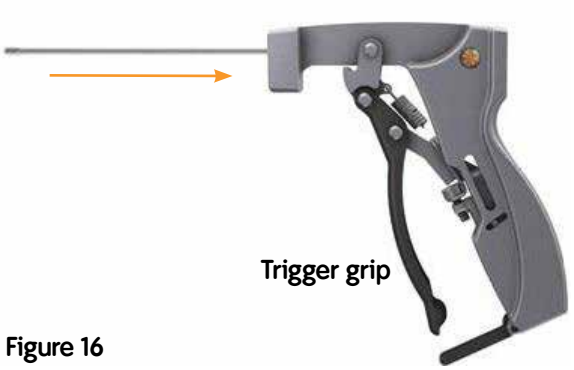


Figure 16

Reducer

Reducer Connector

Figure 17

4. Connect the assembly to the T-handle.
5. Advance the Reducer through the Entry Tube into the intramedullary canal and use the curved tip to direct the 3.0mm Ball Tip Guide Rod past the fracture into the region of the distal epiphyseal scar (Figure 18).

Note: The guide rod should be center-center in the AP and lateral views.

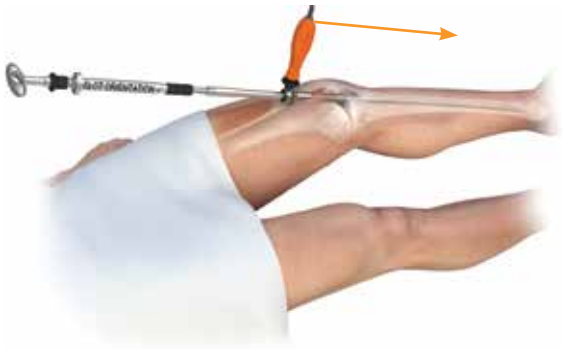


Figure 18

Reduce removal

1. Once the guide rod reaches the desired depth, detach the Gripper and remove the Reducer from the tibial canal.
2. To maintain guide rod position within the canal, slide the Obturator (7167-4078) into the back of the T-handle during extraction (Figure 19).

Figure 19

Determine the implant length

1. Confirm that the Ruler opens easily. If it does not, adjust the thumb-wheel connection at the end to ensure free movement.
2. After the Reducer has been removed, reconfirm the guide rod placement within the distal tibia.
3. Slide the Ruler (7167-4079) over the guide rod until the metal tip contacts the proximal tibia (Figure 20).
4. Confirm the guide rod position in the window at the opposite end of the Ruler as shown in order to ensure accurate implant measurement (Figure 21).
5. Push down on the top of the Ruler until it contacts the 3.0mm Ball Tip Guide Rod.

   Note: Ensure that the ruler is in contact with the Ball Tip Guide Rod.
6. Read the implant length from the exposed calibrations at the end of the Ruler.
7. Confirm fracture reduction to ensure that the implant length is not underestimated. Reference the fibula for accurate fracture distraction or compression.

Figure 20

Figure 21

Unreamed technique

1. Use radiographic templating to determine nail size (Figure 22).

   Note: The appropriate-diameter implant provides translational fill within the isthmus of the intramedullary canal.

2. To help avoid implant incarceration during insertion, select a nail approximately 1.0–1.5mm less than the narrowest canal measurement on the lateral radiograph.

   Note: The 8.2mm diameter of the Reducer provides an initial determination of the canal width in small-diameter tibias.

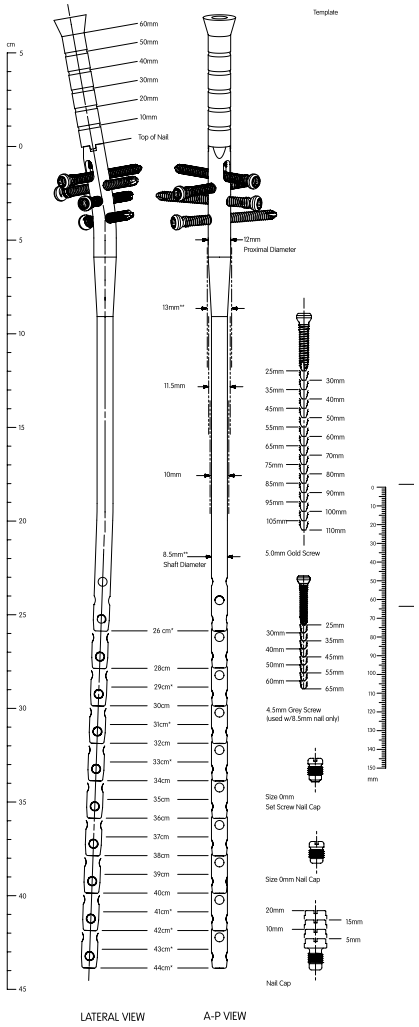


Figure 22: TRIGEN® META-NAIL® Tibial Nail Radiographic Template, Cat. No. 7118-0810

Reamed technique

1. Use radiographic templating to determine nail size.
2. Use the 9.0mm Front Cutting Reamer Head (7111-8231) and Flexible Reamer Shaft (7111-8200) to ream the intramedullary canal sequentially in half-millimeter increments to a size 1.0–1.5mm larger than the selected nail size (Figure 23).
3. To ensure Guide Rod placement during reaming, insert the Obturator (7167-4078) into the back of the Reamer unit during retraction.
4. Continue to confirm Guide Rod placement in the distal tibia throughout reaming.

   Note: Periodically move the reamer back and forth in the canal to clear debris from the cutting flutes.

Figure 23

Nail assembly

1. Use the Semi-extended Guide Bolt (7165-4525) to attach the META-NAIL® Semi-extended Drill Guide (7165-4524) to the nail.
2. Tighten with the Guide Bolt Wrench (7163-1140) and T-handle. The nail is correctly aligned when:
   - The vertical black line on the posterior side of the insertion barrel aligns with the line on the posterior side of the nail.
   - The "A" on the anterior side of the nail aligns with the "A" on the anterior side of the insertion barrel (Figure 24).
   - The apex of the nail's proximal Herzog Bend faces posteriorly and the drill guide is oriented anteriorly (Figure 25).

   Note: The bevel on the front of the nail marks the connection to the drill guide and can be seen in the lateral view as a means to determine proximal insertion depth.
3. Attach the META-NAIL Anterior Drop (7165-4501) to the drill guide.

   To verify the accuracy of the target, insert a gold 9.0mm Drill Sleeve (7163-1152) and silver 4.0mm Drill Sleeve (7167-4083) into the drop (Figure 26), and then pass a 4.0mm Long Pilot Drill (7163-1110) through the assembly.

   Note: An incorrectly attached nail will not target.

   Note: If using the SURESHOT® Distal Targeting System, refer to the TRIGEN® SURESHOT Distal Targeting System's User Manual (REF 7118-1540) for the field accuracy check instructions.

Figure 24

Figure 25

Figure 26

Nail insertion

Remove the Entry Tube and Handle

1. Remove the Anterior Drop and attach the Cannulated Impactor-Medium (7167-5081) to the drill guide.
2. Orient the drill guide assembly in the AP (anteroposterior) position.
3. Use light blows with the Slotted Hammer (7167-4082) to advance the nail over the guide rod.

   Note: If excessive force is required to insert the nail, additional reaming of the intramedullary canal may be required.
4. Verify fracture reduction as the nail crosses the fracture site by paying close attention to rotation, length, alignment, distraction and/or shortening of the affected limb.
5. Check the final nail position in both the AP and lateral views to confirm correct alignment.

   Note: To obtain provisional fixation of the proximal tibial fragments, reattach the Anterior Drop and insert the gold 9.0mm Drill Sleeve (7163-1152) and silver 4.0mm Drill Sleeve (7167-4083) into one of the two Blocking Screw holes in the Drop, then pass a 4.0mm Long Pilot Drill (7163-1110)* through the drill sleeves.

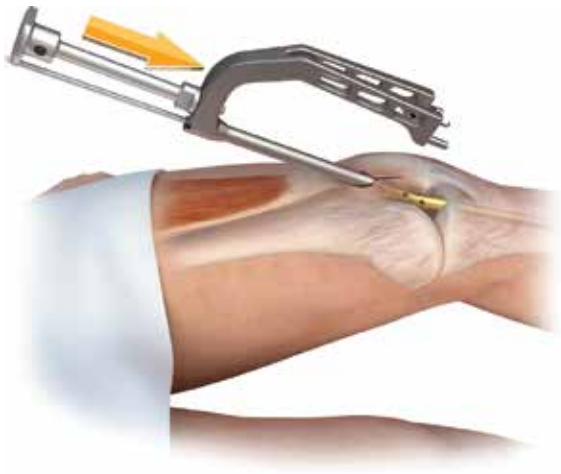


Figure 27

*The 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)

Check nail depth

Check the proximal nail depth

In the lateral view, confirm nail position by observing the nail/drill guide junction (Figure 28).

Note: If compression or dynamic locking is desired, countersink the nail approximately 10mm in order to avoid implant prominence.

Figure 28

Check the distal nail depth

1. In the AP and lateral views, confirm that the nail has been inserted to the desired depth (Figure 29).

   Note: Optimal insertion depth, which will allow room for screw insertion below the fracture, is essential. Distal third tibial fractures require at least two locking screws to maintain stability.
2. Remove the Guide Rod once the nail is fully seated.
3. Reattach the Anterior Drop.
4. Following nail insertion, confirm that the nail and drill guide are securely connected. Hammering can loosen the Guide Bolt.

Figure 29

Lock the screw

Determine the length of the locking screw

There are three options available to determine the locking screw lengths:

- Gold 9.0mm Drill Sleeve, silver 4.0mm Drill Sleeve and 4.0mm Long Pilot Drill* (Figure 30A).
- Screw Depth Gauge (7163-1189) (Figure 30B).
- Screw Length Sleeve (7167-4085) and 4.0mm Short Drill (7163-1117)** (Figure 30C).

Note: For information regarding Drill Depth Measurement Software (DDM) using the TRIGEN® SURESHOT® Targeting System, refer to the TRIGEN SURESHOT Targeting System User Manual (7118-1540). The DDM software can be used for distal locking only.

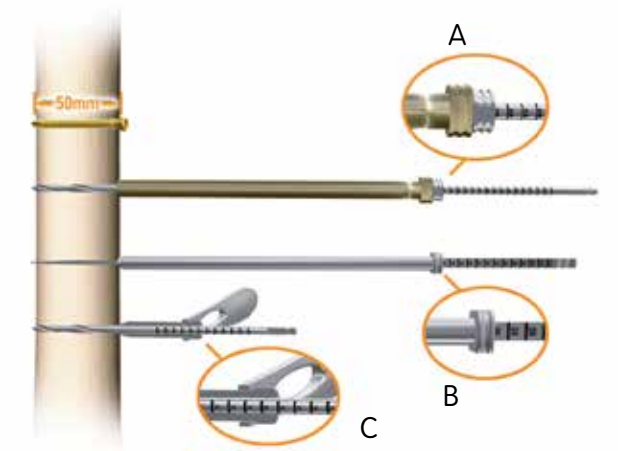


Figure 30

Insert the Locking Screws

Proximal locking options include three statically locked threaded holes and one slot that allows for both fracture compression and/or dynamization. These are targeted through the orange and blue color-coded holes on the Anterior Drop.

Distal locking options include three statically locked holes: two ML (mediolateral) and one AP. The most distal ML hole is threaded for additional stability.

Gold 5.0mm locking screws are compatible with 10mm, 11.5mm and 13mm diameter nails. Grey 4.5mm locking screws are compatible with 8.5mm diameter nails.

Note: Do not use the 4.0mm Short Step Drill (7164-1123) when drilling for a grey 4.5mm locking screw. Its diameter transitions from 4.0mm to 4.7mm and will drill too large a hole in the near cortex, which may compromise locking screw purchase.

Note: If using the SURESHOT Distal Targeting System, be sure to remove the probe prior to proximal locking.

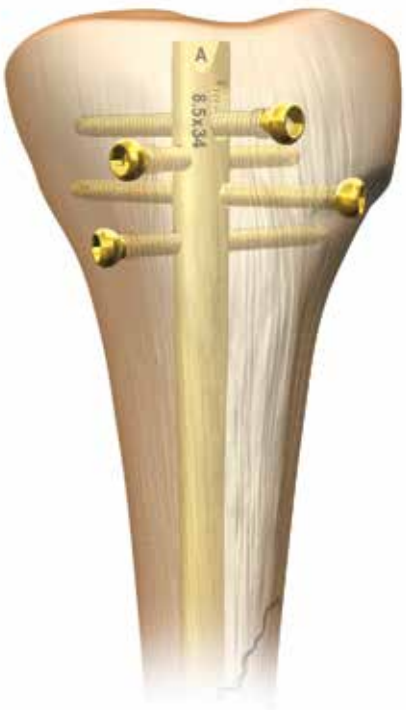


Figure 31: META-NAIL® Tibial Nail with all four proximal screws inserted

*The 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)

**The 4.0mm Short Drill (7163-1117) is interchangeable with 4.0mm AO Short Drill (7163-1123)

Proximal locking

Static locking

1. Make a small incision at the site of screw entry.
2. Insert the gold 9.0mm Drill Sleeve and silver 4.0mm Drill Sleeve through the static slot (STAT) on the Anterior Drop (Figure 32) down to bone.
3. Drill both cortices with the 4.0mm Long Pilot Drill*.
4. Measure for screw length using either the calibrations on the 4.0mm Long Pilot Drill* or by removing the 4.0mm Drill Sleeve and using the Screw Depth Gauge.
5. Attach the appropriate-length screw to the end of the Medium Hexdriver (7163-1066).
6. Use power to insert the screw through the gold 9.0mm Drill Sleeve until the laser-etched ring on the Hexdriver reaches the back of the Drill Sleeve.
7. Attach the T-handle to the Hexdriver and tighten the screw by hand.

Figure 32

Dynamic locking

1. With the nail countersunk approximately 10mm, make a small incision at the site of screw entry and insert the gold 9.0mm Drill Sleeve and silver 4.0mm Drill Sleeve through the dynamic slot (DYN) on the Anterior Drop down to bone (Figures 33 and 34).
2. Drill both cortices with the 4.0mm Long Pilot Drill*.
3. Use the techniques described in the "Lock the Screw" section to measure and insert the screw.

   Note: Use the "TIBIA" and "ALL NAILS" holes marked on the META-NAIL◊ Anterior Drop.

   Note: If the screw is left in the dynamic mode, a nail cap cannot be used as it will push against the locking screw.

Figure 33

Figure 34

*The 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)

Proximal locking: Compression

There are two methods that can be used to compress the fracture:

Compression Driver method

1. Countersink the nail a minimum of 10mm (Figure 35).
2. Lock the nail distally.
3. Reduce the fracture as much as possible to maximize the advantage of the compression driver.
4. Insert a screw through the proximal side of dynamic slot as described in the “Dynamic locking” section.
5. Remove the gold 9.0mm Drill Sleeve and Medium Hexdriver.
6. Attach the Universal Compression Driver (7165-4528) to the T-handle and thread it through the guide bolt into the top of the nail until it contacts the most proximal 5.0mm locking screw (Figure 36).
7. Turn the Compression Driver clockwise to advance the driver and drive the locking screw distally, which will compress the fracture up to 7mm (Figure 37).

   Note: If there are screws in the other proximal holes, the fracture cannot be compressed.

   Note: Use fluoroscopy to check dynamic screw position when compressing the fracture.
8. Once the fracture gap is adequately compressed, lock the nail with up to three additional proximal static screws while the Anterior Drop is still attached to the drill guide.

   Note: If the Compression Driver is progressed after the fracture is fully compressed, the locking screw will begin to bend. In extreme cases where excess force is applied, the screw may break upon removal.

Figure 35

Figure 36

Figure 37

Nail Cap Set Screw method

1. Lock the nail distally, then fully insert the dynamic locking screw as previously described.
2. Remove the Drill Guide/Anterior Drop assembly.
3. Insert the Nail Cap Set Screw (7165-6000) into the top of the nail and advance with the Medium Hexdriver/T-handle assembly until the fracture is compressed and the Nail Cap Set Screw has fully engaged the locking screw (Figures 38a and 38b).

   Note: If there are screws in the other proximal holes, the fracture cannot be compressed.

   Note: Use fluoroscopy to check dynamic screw position when compressing the fracture.

   Note: For information on the use of Blocking Screws, refer to the TRIGEN® META-NAIL® Tibial Nail Surgical Technique (7118-1610).

Figure 38a

Figure 38b

Nail extraction: *optional*

Standard technique

1. If implanted, remove the Nail Cap or Nail Cap Set Screw by using the Medium Hexdriver/T-Handle assembly.
2. Remove all the distal locking screws, and all but one of the proximal locking screws.
3. Thread the Cannulated Impactor-Medium (7167-5081) or Cannulated Impactor-Long (7163-1185)* into the back of the Disposable Nail Extractor (7163-1320)**.
4. Thread the assembly into the top of the nail.
5. Remove the remaining proximal locking screw.
6. Use the Slotted Hammer with a back-slapping motion to extract the nail (Figure 39).

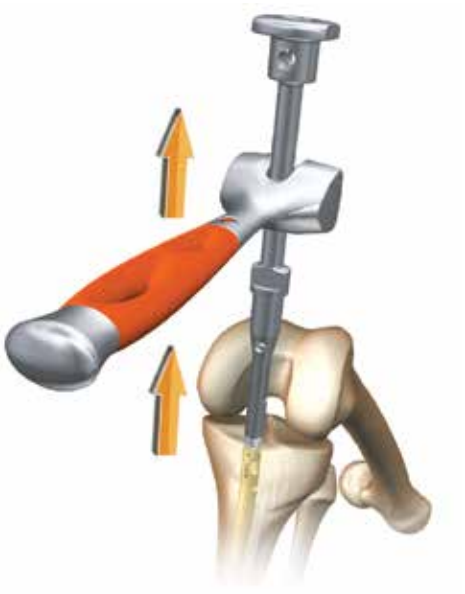


Figure 39

*The Cannulated Impactor-Long is located in the original TRIGEN® Instrument Set (7163-1326)

**The Disposable Nail Extractor (7163-1320) is interchangeable with the Large Nail Extractor located in the original TRIGEN Instrument Set (7163-1326) and the HFN Instrument Set (7170-0001)

Percutaneous technique

In the absence of a Nail Cap or Nail Cap Set Screw:

1. Use the Medium Hexdriver/T-handle assembly to remove all distal locking screws and all but one of the proximal locking screws.
2. Under fluoroscopy, insert a 3.2mm Brad Point Tip Guide Pin (7167-4130 or 7163-1436) into the top of the nail either using power or by hand (Figure 40).
3. Make a 2cm incision around the pin.
4. Advance the 12.5mm Entry Reamer over the pin and into the top of the nail to remove any bony ingrowth (Figure 41).

   Note: The flared portion of the Entry Reamer enters the top of the nail.
5. Thread the Cannulated Impactor-Medium or Cannulated Impactor-Long* (7163-1185) into the back of the Disposable Nail Extractor** (7163-1320).
6. Thread the assembly into the top of the nail.
7. Remove the remaining proximal locking screw.
8. Extract the nail with a back-slapping motion.

Figure 40

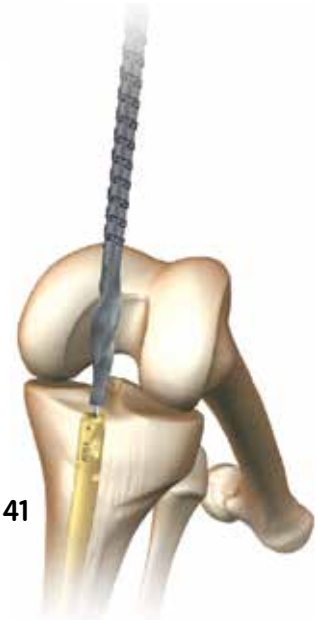


Figure 41

An alternative method for extraction

Guide rod jamming technique

1. Advance the end of a 3.0mm Ball Tip Guide Rod through the end of the nail.
2. Insert the smooth end of a 2.0mm Ball Tip Guide Rod (7175-1146) in the same manner.
3. With both guide rods in place, attach the Gripper to the end of the 3.0mm Ball Tip Guide Rod.
4. Pull the Gripper back so that it wedges the ball tip against the 2.0mm Guide Rod.
5. Backslap against the Gripper with the Slotted Hammer to extract the nail.

Guide rods	
Cat. No.	**Description**
7163-1626	3.0mm x 1000mm Ball Tip Guide Rod
7175-1146	2.0mm x 600mm Ball Tip Guide Rod

Additional removal items	
Cat. No.	**Description**
115074	Large Extractor Hook*
115073	Small Extractor Hook*

*Available sterile packed. For nail removal only: do not use for nail insertion.

**Located in RUSSELL-TAYLOR Extraction Kit (Set #7508), available through Loaners.

Catalog information

TRIGEN® Base Instrument Set

Set No. 7167-4012

Cat. Item	Description	Qty
7112-9401	Small Outer Case	1
7112-9402	Lid for Outer Case	1
7167-4021	TRIGEN Base Tray	1
7163-1066	Medium Hexdriver	1
7163-1068	Short Hexdriver	1
7163-1116	12.5mm Entry Reamer	1
7163-1140	Guide Bolt Wrench	1
7163-1152	9.0mm Drill Sleeve	2
7163-1161	Multipurpose Driver	1
7163-1186	Mini Connector	1
7163-1189	Screw Depth Gauge	1
7167-4000	Cannulated Awl	1
7167-4060	Entry Portal Tube	1
7167-4074	3.2mm T-handle Trocar	1
7167-4075	Honeycomb	1
7167-4076 or 7167-4576	T-handle	1
7167-4077	Reducer	1
7167-4077	Reducer Connector	1

Cat. Item	Description	Qty
7167-4078	Obturator	1
7167-4079	Ruler	1
7167-4080	Gripper	1
7167-4081	Impactor	1
7167-4082	Slotted Hammer	1
7167-4083	4.0mm Drill Sleeve	2
7167-4084	Screwdriver Release Handle	1
7167-4085	Screw Length Sleeve	1
7167-4092	Entry Portal Handle	1
7167-1212	TRIGEN Reamer Set, Optional	1
7111-8200	SCULPTOR® Flexible Reamer, Optional	1
7163-1130	Flexible Reamer Extender, Optional	1
7164-1123	TRIGEN 4.0 Diaphyseal Drill	1
7163-1121	4.0mm Long AO Pilot Drill, 333mm, Disposable	2
7167-1123	4.0mm Short AO Pilot Drill, 161mm, Disposable	1
7167-4130	3.2mm x 343mm Brad Point Tip Guide Pin, Disposable	3
7163-1070	Long Hexdriver, Optional	1
7175-1153	AO Mini Connector, Optional	1
7163-1187	Trinkle to Mini Connector, Optional	1

TRIGEN◇ META-NAIL◇ Instrument Set

Set No. 7165-4002

Cat. Item	Description	Qty
7165-4501	META-NAIL Anterior Drop	1
7165-4502	META-NAIL Drill Guide	1
7165-4503	META-NAIL Extension Drill Guide	1
7165-4505	Extension Guide Bolt (23mm)	2
7165-4506	Guide Bolt Long (51mm)	2
7165-4520	Long Screw Length Sleeve	1
7165-4554	Cannulated Impactor-Short	1
7163-1025	Large Nail Extractor	1

Blocking Screw Instrument Set (Optional)

Set No. 7165-4001

Cat. Item	Description	Qty
7165-4515	Blocking Screw Device	1
7165-4509	Tibial Blocking Screw Attachment	1
7165-4522	11.0mm T-handle Awl	1
7165-4511	8.5mm/10mm Blocking Screw Cartridge	1
7165-4513	11.5mm/13mm Blocking Screw Cartridge	1
7165-4514	Offset Blocking Screw Cartridge	1
7165-4523	Blocking Screw Alignment Pin	2
7163-4508	Retrograde Femoral Blocking Screw Attachment	1

TRIGEN◇ META-NAIL◇ Semi-extended Instrument Set

Set No. 7165-4004

Cat. Item	Description	Qty
7165-4524	Semi-extended Drill Guide	1
7165-4525	Semi-extended Guide Bolt	2
7165-4527	Semi-extended Guide Pin Sleeve	1
7165-4533	Semi-extended Honeycomb	1
7165-4526	Semi-extended Entry Tube	1
7165-4554	Cannulated Impactor - Short	1
7167-4092	Entry Portal Handle	1

META-NAIL Disposables

Set No. 7165-4003

Cat. Item	Description
7163-1110	4.0mm Long Pilot Drill*
7163-1117	4.0mm Short Drill**
7163-1626	3.0mm x 1000mm Ball Tip Guide Rod
7167-4130 or 7163-1436	3.2mm Brad Point Guide Pin
7165-4528	Universal Compression Driver
7163-1320	Disposable Nail Extractor***

*The 4.0mm Long Pilot Drill (7163-1110) is interchangeable with 4.0mm AO Long Drill (7163-1121)

**The 4.0mm Short Drill (7163-1117) is interchangeable with 4.0mm AO Short Drill (7163-1123)

***The Disposable Nail Extractor (7163-1320) is interchangeable with the Large Nail Extractor (7163-1278) located in the original TRIGEN Instrument Set (7163-1326) and the HFN Instrument Set (7170-0001)

Implants

TRIGEN® Internal Captured Screws 4.5mm and 5.0mm

Set No. 71642005 Set No. 7164-2000

Cat. Item	Length
7164-5420	4.5mm x 20mm
7164-5422	4.5mm x 22.5mm
7164-2125	4.5mm x 25mm
7164-2127	4.5mm x 27.5mm
7164-2130	4.5mm x 30mm
7164-5432	4.5mm x 32.5mm
7164-2135	4.5mm x 35mm
7164-5437	4.5mm x 37.5mm
7164-2140	4.5mm x 40mm
7164-5442	4.5mm x 42.5mm
7164-2145	4.5mm x 45mm
7164-5447	4.5mm x 47.5mm
7164-2150	4.5mm x 50mm
7164-5452	4.5mm x 52.5mm
7164-5455	4.5mm x 55mm
7164-5457	4.5mm x 57.5mm
7164-5460	4.5mm x 60mm
7164-5462	4.5mm x 62.5mm
7164-5465	4.5mm x 65mm

Cat. Item	Length
7164-5020	5.0mm x 20mm
7164-5022	5.0mm x 22.5mm
7164-5025	5.0mm x 25mm
7164-5027	5.0mm x 27.5mm
7164-5030	5.0mm x 30mm
7164-5032	5.0mm x 32.5mm
7164-5035	5.0mm x 35mm
7164-5037	5.0mm x 37.5mm
7164-5040	5.0mm x 40mm
7164-5042	5.0mm x 42.5mm
7164-5045	5.0mm x 45mm
7164-5047	5.0mm x 47.5mm
7164-5050	5.0mm x 50mm
7164-5052	5.0mm x 52.5mm
7164-5055	5.0mm x 55mm
7164-5057	5.0mm x 57.5mm
7164-5060	5.0mm x 60mm
7164-5062	5.0mm x 62.5mm
7164-5065	5.0mm x 65mm
7164-5067	5.0mm x 67.5mm
7164-5070	5.0mm x 70mm
7164-5072	5.0mm x 72.5mm
7164-5075	5.0mm x 75mm

4.5mm

5.0mm

TRIGEN META-NAIL® 8.5mm Tibial

Set No. 7165-3002

Cat. Item	Length
7165-5024*	24cm
7165-5026*	26cm
7165-5028*	28cm
7165-5029	29cm
7165-5030*	30cm
7165-5031	31cm
7165-5032*	32cm
7165-5033*	33cm
7165-5034*	34cm

Cat. Item	Length
7165-5035*	35cm
7165-5036*	36cm
7165-5037*	37cm
7165-5038*	38cm
7165-5039	39cm
7165-5040	40cm
7165-5041	41cm
7165-5042	42cm

*Contained in the standard implant set

TRIGEN® META-NAIL® 10mm Tibial

Set No. 7165-3000

Cat. Item	Length
7165-5124	24cm
7165-5126	26cm
7165-5128*	28cm
7165-5129	29cm
7165-5130*	30cm
7165-5131	31cm
7165-5132*	32cm
7165-5133	33cm
7165-5134*	34cm
7165-5135*	35cm
7165-5136*	36cm
7165-5137*	37cm
7165-5138*	38cm
7165-5139*	39cm
7165-5140*	40cm
7165-5141	41cm
7165-5142	42cm

TRIGEN META-NAIL 11.5mm Tibial

Set No. 7165-3001

Cat. Item	Length
7165-5224	24cm
7165-5226	26cm
7165-5228	28cm
7165-5229	29cm
7165-5230*	30cm
7165-5231	31cm
7165-5232*	32cm
7165-5233	33cm
7165-5234*	34cm
7165-5235*	35cm
7165-5236*	36cm
7165-5237*	37cm
7165-5238*	38cm
7165-5239*	39cm
7165-5240*	40cm
7165-5241	41cm
7165-5242	42cm

TRIGEN META-NAIL 13mm Tibial

Cat. Item	Length
7165-5318	18cm
7165-5320	20cm
7165-5322	22cm
7165-5324	24cm
7165-5326	26cm
7165-5328	28cm
7165-5329	29cm
7165-5330	30cm
7165-5331	31cm
7165-5332	32cm
7165-5333	33cm
7165-5334	34cm
7165-5335	35cm
7165-5336	36cm
7165-5337	37cm
7165-5338	38cm
7165-5339	39cm
7165-5340	40cm
7165-5341	41cm
7165-5342	42cm
7165-5343	43cm
7165-5344	44cm
7165-5346	46cm
7165-5348	48cm
7165-5350	50cm

Nail Cap Set Screw

Cat. Item 7165-6000

TRIGEN Nail Caps

Cat. Item	Length
7163-4000	0mm
7163-4005	5mm
7163-4010	10mm
7163-4015	15mm
7163-4020	20mm

*Contained in the standard implant set

Notes:

Notes:

Notes:

Caution: *U.S. Federal law restricts these devices to sale by or on the order of a physician.*

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